

Chapter 22

PERCEPTIONS OF PUBLIC TRANSPORTATION

GEORGE E. GRAY

As we approach the twenty-first century, the public appears to be reassessing its use of the automobile and its perceptions of the roles expected of public transit. As late as the 1960s, relatively little public thought was given to the subject, but a number of factors have changed that. It is important that the industry, planners, decision makers, and others involved in public transportation keep abreast of the changes in public attitude that are occurring, which, collectively, may be the single most important determinant of the future roles of such service. For, after all, it is the public's perceptions that result in ballot-box decisions. Reed summarized the opportunities as follows:

Today is clearly a turning point in the story of the automobile. And public transportation could gain from the new public perceptions of the auto and its consequences. If concern with a continued gasoline shortage or pollution control or the environment remains high, transit could regain patrons and once again become a prominent mover. The energy crisis is real, and transit use could be one of the patterns that result as the country adjusts to costly energy. The alternative, equally likely, is that the auto industry will provide smaller, less obtrusive vehicles and the country will decide to continue the pattern of individualized vehicles as the basic means of transport, the transit industry returning to its role as a welfare organization requiring subsidy to help the disadvantaged.¹

Reed's writing in 1973 was very prophetic. Yet, he did not identify the middle ground, a third scenario that has since been our course: the auto industry has provided smaller vehicles while some auto disincentives or group-ride incentives have been implemented. The evolution in perceptions is still continuing, however, and the final course is still unresolved.

Although this chapter concentrates on perceptions directed at conventional bus

systems, there is no evidence that the attitudes underlying these perceptions cannot be applied to other types of transit service. Some paratransit services, such as car- and vanpooling, better address certain attributes for certain trips, but since there is such a variety of service combinations, the perceptual differences relating to this important transit sector are not examined.

The constantly changing values of modern societies often create conflict as well as opportunity for change. The fundamental facts of the chemistry of air quality and reduced natural resources are affecting existing values to a greater extent than the general public yet completely realizes, but that realization is growing and with it is growing the call for change.

The ability of the transit industry to provide a quality service as an alternative to the automobile is a key element in influencing the reaction to the problems of air pollution, energy restrictions, and congestion. Most transportation authorities agree that these external factors, pressuring for changes in our mobility and our methods of achieving that mobility, are major determinants of the growth and acceptance of public transit. Nevertheless, it is obvious that the industry must continue to improve its service and image in order to overcome the general public's formidable resistance, which inhibits significant increased use of most systems. In 1977, about 95% of the *choice riders*, those who had the option of using an auto or taking transit, always used the auto. Several attitude surveys taken in the mid-1970s and the 1980s indicated that, even if considerable disincentives were established on auto use, most people would continue using that mode.

In this chapter, various groups and their attitudes toward transit will be identified. Based on numerous studies, factors that appear to be significant to the groupings will be assessed. Finally, the major factors that affect our perceptions will be discussed and some strategies that may help in strengthening public acceptance of transit use suggested.

Government at all levels has a tremendous responsibility in addressing the problems of mobility. Those engaged in the energy, environmental, and political tugs of war direct much of their rhetoric to this problem without any prior determination as to the basic need for transportation. In the 1980s there was still no established national policy on the subject, and most state and local government units had little more to offer in this regard. The shotgun approach with categorical emphasis appeared to be the accepted practice, with uncoordinated Band-Aid programs continuing to proliferate. The continued requirements for transportation improvement plans (TIPs) and their transportation systems management elements (TSMEs) as established in 1976 had helped to focus on mobility and increased coordination efforts. Although these requirements have the potential to change the basic planning process considerably and to orient it more toward being an effective programming tool, the changed process has yet to be fully developed. Given the history of past changes in the planning process, years will be necessary to develop an effective process (see Chaps. 3 and 13). The efforts of the U.S. Department of Transportation (U.S. DOT) to establish a national transportation policy may be able to draw the conflicting transportation interests together to develop a policy that will receive the needed legislative and administrative

endorsement to become the basis of national commitment. Obviously, changing times force a reappraisal of many aspects of our present society, and transportation is but one of these. Unfortunately, it is so ubiquitous and so influential that even minor changes in the methods of providing transportation have ripple effects in almost all aspects of our lives. These consequences have been largely ignored by our government. Except during times of tremendous highway development, government bodies in the United States have not used transportation, to any great extent, as a major tool to help achieve other goals, such as to control land use, reinforce a national energy program, or reduce air pollution.

Federal emphasis on air quality has impacts on all aspects of transportation, because the potential pollution reductions in the transportation sector are so large. As important and necessary as air pollution reduction is, however, it is unfortunate that mobility needs are not considered more. Mobility needs are the cause, and air pollution is the effect. Assuming that this lack of attention to mobility needs will change as we learn to live at a less polluting pace and consume less of our nonrenewable energy resources, it is apparent that it is necessary to learn more about the various groups most affected by public transit so that service can be better adapted to address their concerns. At the same time, we may learn how to attract more choice riders to public transit.

THE CONCERNED GROUPS

One of our needs is to identify the various viewpoints that should be considered in looking at transit service. One early study broke the viewpoints into four groups, but had a stratification resulting in a total of 79 categories.² Four major groups are self-evident: the transit users, the nonusers, the providers (operators), and the community as a whole (a classification that will be used to represent the spectrum from a small town to the nation as a whole).

THE USERS

Users can be considered to be composed of *captive users*, who have no alternative method for making a particular trip, and *choice users*, who do have an alternative available. The captive market in this country is much larger than many realize. It is about half of the population at any one time. Included in this group are not only the elderly, the young, and certain of the disabled, but also those without an automobile available, including the stranded homemaker. The choice riders—the rest of the population except for a relatively small number who because of age or health are restricted from using public transit—are those who have an alternative transportation mode readily available.

Although the choice user group presents a large potential market for transit, it is

also one that is difficult to attract. Tehan and Wachs propose using psychological considerations in the development and evaluation of new transit services in an attempt to meet the fundamental satisfactions of these possible users.³ Their paper discusses methods of improving both the image and quality of public transit, with these users' fundamental needs in mind, and draws parallels with the development and marketing of the automobile. Although such psychological considerations have not been ignored, they have not, for the most part, been adequately addressed.

Besides conventional transit, a number of specialized services have been developed to meet the needs of captive users. These special services range from those provided by various human services agencies to meet the particular needs of their clients to those established for a portion of the market, such as the wheelchair user and the elderly. Such services may be provided by transit districts normally dedicated to operating conventional services, a variety of paratransit agencies, or other social and human services organizations.

THE NONUSERS

Nonusers include those who are unable to use transit as well as those, the choice riders, who do not choose to use it for a variety of reasons. No doubt a large number of these reasons are psychological, but many are based on either physical limitations or mobility needs that cannot be readily served by transit. Of course, these deterrents will vary in accord with the particular type of service provided, but there will still always be a large number of nonusers who cannot be adequately accommodated. An example would be television technicians, who must carry their tools and repair parts with them.

THE PROVIDERS (OPERATORS)

Providers have changed their perspective considerably since the 1970s. Until fairly recently, the major concern for too many of them was to provide service at a profit, or at least a minimal loss. As all major and many smaller systems have come under public ownership, transit managers have been increasingly interested in how to provide better service at a reasonable cost, even though operating costs are not recovered in the farebox. The emphasis has changed, but the main constraint—limited resources—still dominates their perceptions and resulting actions since the deficits must somehow always be covered. Increasing socially oriented services, such as reduced fares for selected groups during certain periods, causes conflicting objectives for the providers. Providing such human-services programs distorts the financial picture for the transit organization, and the resulting costs are often not adequately understood by their governing bodies or by the public. For instance, federal law stipulates that senior citizens pay only half-fare for off-peak service. In only a few isolated cases are such human-services costs subsidized by their respective social programs.

Another problem that has surfaced with public ownership is the propensity for the governing board to be more conservative in providing resources for transit when the local roads and streets are judged to be underfunded.

THE COMMUNITY

The perspectives of the community are becoming more and more the major determinants of establishing programs for newly developing public transit. Meanwhile, the perceptions among this group are probably the least stable and are undergoing considerable change.

In most areas of this country, mobility has been dominated—even overwhelmed—by the automobile. Such domination causes severe impacts, such as (1) air and sound pollution; (2) increasing auto congestion, which lowers the efficiency of the auto and all those services that share its delegated space; (3) the high social and economic costs of extending or expanding the highway network; (4) land-use concerns focused on providing for the auto; (5) concern for those not served by the auto except at a very high cost—many of these people, the elderly, disabled, and young, feel that they have a civil right to economical, accessible transportation; and (6) diminished resources, specifically the energy problem, which, coupled with air pollution, is bound to eventually cause severe changes in existing transportation patterns.

CHANGING PERCEPTIONS

Obviously, the attitudes of individuals will differ with their particular circumstances. The transportation requirements of a home-to-work trip are quite different from those felt necessary to attend a society ball. Although both trips can be made in comfort by many of the same modes, the range of "acceptableness" of alternatives is different. Peer-group attitudes, financial resources, and a host of other factors can influence acceptableness. To make it even more complex, attitudes change over time and space. Our involvement in the war in Viet Nam was an obvious example of the former, and one has only to compare the travel habits of residents of San Francisco or New York with the average resident of Los Angeles to exemplify the latter.

The closing of the San Francisco—Oakland Bay Bridge as a result of the 1989 Loma Prieta earthquake was a good example of a reason for public perception change. Overnight it became necessary for the 80,000 workday morning peak-period drivers that had been using the bridge to reassess their travel. The largest portion chose to use the parallel San Francisco Bay Area Rapid Transit System (BART). Several months after the disruption, ridership for the BART transbay peak-hour service was still more than 20% higher than prequake. Evidently, many automobile users tried an alternative public transit service and found it not only viable, but preferred.

It is this propensity toward changed attitudes that offers public transportation the opportunity to perform an increased role in providing mobility, especially urban mobility. If the industry can determine the major service attributes to meet user needs and provide them at a reasonable level of public investment, external pressures such as gasoline prices, congestion, parking fees, and environmental concerns, which will modify attitudes, can be expected to cause significant modal shifting.

TRANSIT USERS' ATTITUDE STUDIES

A number of studies have been made to identify and rank the factors that the public considers important in using conventional fixed-route transit. A few of these studies will be cited to illustrate the broad coverage of study types and the results obtained. A study by INTERPLAN identified six general attribute categories relative to mobility choice decisions:⁴ accessibility, efficiency, reliability, comfort, safety, and cost. This study made no attempt to rank these factors.

A system to measure the effectiveness of the transportation services of local government was developed for the U.S. Department of Housing and Urban Development (HUD) by the Urban Institute.⁵ The system was based on the quality of transportation as seen by the citizen—consumer and cited the major objectives of a local transportation system: "ease of access to the places people want to go, convenience, travel time (reasonable speed), comfort, safety, economy, maintenance of a habitable environment, and satisfaction among citizens with the overall adequacy of the system."⁶

One of the most comprehensive studies was research conducted by a University of Maryland team over a 3-year period.⁷ It included pilot studies in Baltimore and Philadelphia. These studies ranked variables in order of importance for both work and nonwork trips and found that the differences in relative importance were slight except for the travel-time factor. They concluded that the following list of factors⁸ (in order of importance) suggested the basic attributes of a generalized, ideal transit system:

- ° Reliability of destination achievement (including elements of safety and confidence in the vehicle).
- ° Convenience and comfort.
- Travel time (but with large trip-purpose differences).
- ° Cost.
- ° State of vehicle (with cleanliness overshadowing newness).
- ° Self-esteem and autonomy (with emphasis on independence rather than pride).
- Traffic and congestion (both in and out of the vehicle).
- ° Diversions (including nature of travel companions, availability of radio, and scenery).

A national survey of transportation attitudes conducted under the sponsorship of the American Association of State Highway Officials (now the American Association of State Highway and Transportation Officials) and the Bureau of Public Roads (now the Federal Highway Administration) identified many of the same items.⁹ This survey, however, besides being somewhat dated, was evidently structured toward the use of the auto. Although it was comprehensive, it is of questionable value for the purposes of determining the relative factors that inhibit transit use. It does include valuable information on the segmented transportation market of the 1950s.

A mail questionnaire in the Twin Cities area by Beier attempted to identify why auto use dominated over bus transit. His study resulted in the following top-ranked factors:¹⁰

- Quickest travel time.
- Elimination of waiting periods
- Freedom from schedules.
- Reliability of the car.
- Protection from the weather.

A subsequent study by Lovelock agreed substantially with the earlier investigations and recommended three basic strategies operators could use to stimulate patronage:¹¹ change the physical attributes of vehicles and stations for comfort and safety, change operational characteristics for better service, and use persuasive communication to change nonuser attitudes and preferences.

Stephenson, in a study of commuter attitudes of graduate students at the University of Minnesota, came up with the following listing of the 10 top factors favoring the auto:¹²

- Reliability.
- Able to leave when you desire.
- Shortest door-to-door time.
- Able to stop when you wish.
- Weather protection.
- Adequate space to carry items.
- Transfer not needed.
- Independence.
- Clean vehicle.
- Able to travel at own speed.

A comprehensive study by the Orange County Transit District in California focused on the identification and assessment of the relative importance of the attributes of transit as conceived by the consumer and the determination of the extent to which consumers consider that existing modes satisfy their needs.¹³ The results were in general agreement with the earlier studies, but indicated that the public placed much more importance on bus-driver attitude than previously identified. Strong general support for transit was found, with 84% responding that benefits of transit were well worth the cost and 90% feeling that bus transport would make their city more livable. The strongest support for transit was found in the demographic groups least likely to use transit, those with incomes over \$25,000 per year or with two or more autos. This study provided a good example of how results can be used for policy guidance and management decisions. For example, interpretation of the study results pointed out that in this country more effort was needed to market transit—an interested but largely uninformed public was identified.

The study also disclosed that attitudes concerning other transportation services are evidently not basically different from those focused on fixed-route transit. As part of a program to increase auto occupancy through the formation of carpools, insight into the reasons for basic modal choice decisions was researched so that proposed actions

could address the identified reasons behind transportation mode choice. Each person in the survey was asked to rate attributes of work travel as to importance in the mode selection for work trips. A total of 11 factors was included. The four receiving highest importance were reliability, safety from accidents, convenience, and safety from crime. Costs were not specifically identified as an attribute.

A review by Martin Wachs of various studies indicated that the relevant factors influencing modal choice were travel time, reliability, convenience, comfort, safety, cost, and amenities.¹⁴

Another survey, this one by Hoey and Levinson, covering a medium-size community, found radical differences between transit users and nonusers regarding acceptable transit service levels.¹⁵ Even with an acceptable level of service, nonusers indicated that external factors would be needed to change their travel habits. The study concluded:

*The survey indicates that existing transit riders have a much lower expectation regarding bus service attributes than car drivers. Thus, radically improved service concepts and levels will be necessary to divert motorists to transit use; and they may be feasible only in selected corridors. If energy, environmental, or public policy considerations require large scale diversions of commuters to transit, then selected auto disincentives may be necessary. Increased motor fuel taxation appears to be more productive than parking taxes and controls— least in medium-sized cities.*¹⁶

The Center for Urban Transportation Research of the University of South Florida in a comprehensive report, *Factors Related to Transit Use*,¹⁷ addressed the consumer preferences of both automobile users and transit users in 17 metropolitan areas across the country who had ready access to public transportation. Among the findings were:

- 22% were "auto captives."
- 30% were "transit dependent."
 - Of the transit dependent, only 37% indicated they would drive to work if an automobile were available.
 - The four most significant reasons given by the transit users for not using the automobile were (1) cost of parking, (2) availability of parking, (3) travel time, and (4) traffic congestion.
- About half of those driving to work could be considered potential transit riders if flexible and convenient transit service were provided.
- Other factors that would favor increased transit use were nontransfer services, express routes, and increased auto parking fees.
- Traffic congestion was viewed as very serious by 36% of respondents and somewhat serious by 28%.

The results of these various studies were far from identical, or even similar in some cases. That, however, does not detract from their value. Attitudinal surveys similar to these are finding increasing popularity with transit organizations and proving to be valuable in helping to determine the type of service that should be considered in a particular area. They are also frequently used in planning studies in ranking proposed service alternatives for new systems.

THE "SCARCE" AMENITIES

Analysis of the various surveys and readings in the field suggests grouping the factors influencing the use of transit into the acronym SCARCE—unfortunately, a most appropriate description of their availability in some transit operations. SCARCE stands for:

Safety.

Comfort.

Accessibility.

Reliability.

Cost.

Efficiency.

These attributes cover all the major items listed in the cited studies as well as others not referenced in the previous discussion.

It is important to note that there is no rating of importance implied in this acronym. It is obvious from a review of the numerous studies that ranking is not practical. People just are not consistent. They have different needs for different trips at different times in their life-cycles. Besides, there is lack of uniformity in the terminology used in the various studies or surveys.

A short description of the elements constituting these various attributes follows.

Safety (on vehicles and at stops) includes not only safety from accidents but also passenger safety from theft and physical violence, as well as vehicle safety from vandalism.

Comfort embraces the physical comfort of the passenger within the vehicles and at stops (ride quality, adequate environmental controls, effectual seating, handholds, sufficient entrances and exits with easy fare collection, package accommodations); the aesthetic qualities of the system (clean and pleasingly designed vehicles, attractive stops, terminals, guideways, and other facilities); environmental protection of the community (noise and exhaust emissions); facilities for the handicapped; and pleasant, considerate, and helpful operators.

Accessibility implies adequacy of route distribution over the area served, vehicle capacity, service frequency and operating time span, identification of stops and vehicles, and distribution of information on fares, schedules, and the like, as well as ease of fare paying and well-placed stops and terminals.

Reliability depends on low breakdown rate, with special services provided when breakdowns do occur, adherence to schedules with adequate information about any service changes, and guaranteed availability of transfer.

Cost means reasonable, guaranteed fares with minimum zone fares (if any) and easy transfer mechanisms and possibly cost reductions for passes (weekly, daily, and so on) and special groups (students, children, senior citizens, and others). Cost should be perceived as favorable compared to automobile use for the same trip.

Efficiency includes high average speeds with minimum dwell times and the absence

of traffic delays, sufficient stops for minimum walking (but not so many as to increase travel time), coordinated schedules and transfer points with minimum user discomfort, direct routing, and express and special-event service when warranted. Efficiency also requires an easily maintained system with adequate maintenance facilities, an efficient management system, and minimal staff necessary to sustain efficient service.

Again, it should be recognized that the attitude toward transit of the three most interested groups (the user, the provider, and the community) with respect to these factors will vary. Even the interests of subgroups within the three principal groups may not be in complete agreement. For instance, the users' requirements vary, depending upon being a commuter, a new traveler to a system (such as a tourist), or a regular user frequenting certain routes (such as the captive rider going shopping).

In some of the identified attributes, there is obvious conflict between the goals of the various groups. For instance, the user and the provider have difficulty agreeing on the amount of service to satisfy certain elements of accessibility, such as adequacy of route distribution, vehicle capacity, and service frequency and time span. This disparity of interests is an example of why conventional transit often cannot compete favorably in an open market with the automobile, and such disparity also indicates why private conventional transit systems rapidly disappeared from the scene. To attract the choice rider, which is the main market for increased ridership, cost-effective service levels cannot be made the sole determining criterion for establishing routings, headways, and the like.

FACTORS AFFECTING THE SCARCE AMENITIES

Seven factors have been identified as being the major causes of the deficiencies in public transit in this country.¹⁸ A short discussion of these factors follows.

Finances

Over the years, lack of funding has severely restricted the development of transit systems. This deficiency, coupled with inadequate allocation of the funds available, contributes to the too frequently found failure to make investments in maintaining the physical plant and equipment as well as to provide for modernization of systems. In many cases, it has resulted in transit systems that will be inadequate to provide for the increased services that will be needed as the air pollution crisis becomes more pronounced. It must be remembered that 3- to 4-year lead times are often necessary to provide added services and up to 10 years for new services.

The addition of Section 5 funding by the Urban Mass Transportation Administration (UMTA) and similar funding by various states, which provides flexibility for capital additions or operating costs, gave temporary relief in the mid-1970s, but the basic problem of inadequate funds, especially to cover ever-increasing operating costs, remains (see Chap. 15).

Transportation policies

Lack of transportation policies has caused imbalances in providing for competitive modes. With few exceptions, parking policies, highway funding, land-use decisions, integrated services, and rate setting were all developed separately. There is little coordinated effort to develop transportation as a whole; only elements of service are addressed. This fractured approach cannot be allowed to continue. A comprehensive national transportation policy agreed upon by the administration and Congress is long overdue. The American Public Transit Association, the American Association of State Highway and Transportation Officials, and others have developed policies reflecting their organizational positions, but the need for an accepted national policy is only more apparent as these more biased policies proliferate. Some state plans that provide policy guidance have been developed, but without a well-established and accepted national policy, such efforts can, at best, be temporary expedients subject to change as federal programs change.

Local political factors

Local political & factors often create a plethora of multiple jurisdictions, legal barriers to coordination, rate constraints, and resistance to cooperation. All too often, local jealousies and the narrow interests of political bodies are allowed to overshadow the long-range public good.

Technology

At present, the development of necessary programs such as vehicle improvement, automated ticket devices, and computerized management systems is hindered by a number of factors. Among these are a lack of development funds, unclear development rights, governmental red tape, and often, apathy on the part of both manufacturers and the general public. The problem of short-range programs based on existing technology versus innovation and the development of new concepts is especially difficult to address in an arena faced with decisions involving major financial commitment for providing transit services.

Labor

In many instances, labor restrictions cause uneconomical operations to continue. There is considerable evidence that, in many cases, increased labor costs, if not counterbalanced by increased productivity, may eventually eliminate much of the existing conventional bus service as a viable alternative. To provide for financially sound transit service, it may become necessary to eliminate, or at least severely restrict, not only the right to strike but some of the more restrictive work rules. A less drastic position would be to provide for required arbitration.

Management

For many years, the industry was in a declining market; now that the demands for increased service are growing, there are complicated managerial problems to overcome. Enlightened management is addressing these, but Smerk (see Chap. 16), among others, makes a strong case that "management has almost always been the weakest link in the mass transit chain."¹⁹

Lack of integration and coordination

Lack of integration and coordination includes such problems as fragmentation of transit service among different agencies, lack of cooperation among agencies, and uncoordinated services within a single agency.

LEVELS OF SERVICE AND THE SCARCE FACTORS

The SCARCE factors are all related to levels of service to some extent. Therefore, one of the best ways to reduce the adverse effects of the SCARCE factors is to increase the quality and quantity of service in general.

The major constraint to an improved level of service continues to be a lack of adequate funding. There is considerable evidence, however, that public attitudes in the 1990s will support increased levels of funding; therefore, this may not be a continuing problem. Programs to improve transit equipment are covered in Chap. 24 and therefore this element to improved service will not be addressed here.

Besides adequate funding and improved equipment, assured effective management and marketing are the remaining necessary elements in providing a high level of service. To improve capability in the management of transit systems, several tools have been made available. UMTA has developed a package of computer programs to provide for management information needs, including cost accounting (Financial Accounting Reporting Elements or FARE), scheduling (Run Cutting and Vehicle Scheduling or RUCUS), maintenance (Service, Inventory, and Maintenance System or SIMS), and planning (Urban Transportation Planning System or UTPS). The greatest additional needs in this area appear to be increased training for middle management and established forums for the resolution of operational problems caused by institutional barriers. Needed is more effort aimed at increasing the supervisory capability of the industry by using modern techniques. Both improved and expanded training of existing practitioners and university programs to produce graduates oriented toward entering the transit field are also positive steps that help to produce improved and efficient management, but more needs to be accomplished in these areas.

The changing composition of the population of the United States will place increased pressures on management. The reduction in the relative size of the work force, the competition for skilled and unskilled labor, the drift toward an increased mix of social programs with transportation services are all examples of factors leading to more complicated challenges to management.

WHAT ELSE TO DO TO CHANGE PERCEPTIONS

A variety of actions can be undertaken to improve the public attitude toward public transit and mitigate the adverse aspects of the SCARCE factors. It is important to keep in mind that attitudes are the product of perceptions. You must change the way people perceive a service before you can expect to change their attitudes toward it.

Improved services resulting from increased capital investment, improved management, diversification of types of service, and so on, all have a prominent place. According to L. M. Schneider, however;

The prospect of new capital is not the transit industry's salvation, for capital can too easily be misallocated through investments in inappropriate facilities or dissipated by poor maintenance. The industry is still caught up in the vicious circle of declining productivity, high operating costs, poor service, increasing fares, and level or declining patronage. A radical approach is needed. It is hoped that new marketing-oriented transit strategies will provide the answer.²⁰

Although ridership is increasing in most areas, the basic concept behind this statement is still appropriate. Smerk,²¹ Lovelock,²² and Reed²³ have all given emphasis to this position and agree that focus on market segmentation holds considerable promise.

Lovelock concluded his study with the opinion that, by highlighting the consumer's need for information and the relationship between modal choice behavior and attitudes, relatively inexpensive marketing and communication programs might be extremely effective in encouraging the use of public transit.²⁴ His study also contained several proposed strategies involving elements of the market. Reed took this last approach considerably further and gave a comprehensive analysis of the value of using a segmented marketing approach for the promotion of transit.²⁵ (For a close look at macro-marketing, see Chap. 17.)

SUMMARY

Attitude surveys in the public transit sector have the potential of providing needed information leading to improved service at a reasonable cost and over a comparatively short time frame.

A study of the literature on transit attitudes indicates considerable agreement on the major factors that influence the level of transit use of the choice rider, although the priority of importance of the factors is varied. The factors can be represented by the acronym SCARCE, standing for Safety, Comfort, Accessibility, Reliability, Cost, and Efficiency. These six major factors reflect, all too often, the present deficiencies in public transit service. Strategies to mitigate these six elements and improve the SCARCE amenities include the improvement of service levels, equipment, management techniques, and marketing.

REFERENCES

Some citations are no longer available from their original source. These citations are often available from the National Technical Information Service, U.S. Department of Commerce, 5285 Port Royal Road, Springfield, VA 22161. We have verified the order numbers for many of these citations, and they are found at the end of the citation. Prices are available through NTIS at the address above.

- 1 RICHARD R. REED, *Market Segmentation Development for Public Transportation*, Research Report no. 8, prepared for UMTA (Stanford, Calif.: Stanford University Department of Industrial Engineering, August 1973), pp. 38-39. Now available as PB 227 178.
- 2 J. L. SORENSON, "Identification of Social Costs and Benefits in Urban Transportation," in *Systems Analysis of Urban Transportation: Study in New Systems of Urban Transportation, Volume III: Network Flow Analysis*, prepared by the General Research Corporation for HUD (Santa Barbara, Calif.: General Research Corporation, January 1968), pp. 22-25.
- 3 CLAIRE TEHAN AND MARTIN WACHS, "The Role of Psychological Needs in Mass Transit," *High Speed Ground Transportation Journal*, 9, no. 2 (Summer 1975), 35-50.
- 4 ROMAN KRZYCZKOWSKI AND OTHERS, *Integration of Transit Systems, Summary*, prepared for UMTA (Santa Barbara, Calif.: INTERPLAN Corporation, October 1973). Now available as PB 241 273.
- 5 RICHARD E.. WINNIE AND HARRY P. HATRY, *Measuring the Effectiveness of Local Government Services: Transportation*, prepared for HUD (Washington, D.C.: The Urban Institute, n.d.).
- 6 Ibid., p. v.
- 7 ALLAN N. NASH AND STANLEY J. HILLE, "Public Attitudes Toward Transport Modes: A Summary of Two Pilot Studies," in *Public Attitudes Toward Highway Improvements*, Highway Research Record 233 (Washington, D.C.: Highway Research Board, 1968), pp. 33-46.
- 8 Ibid, p. 43.
- 9 ROBERT K. MCMILLAN AND HENRY ASSAEL, *National Survey of Transportation Attitudes and Behavior, Phase I: Summary Report*, NCHRP Report 49 (Washington, D.C.: Highway Research Board, 1968).
- 10 FREDERICK J. BEIER, *Attitudes of Drivers Toward Mass-Transit*, prepared for UMTA (Minneapolis, Minn.: University of Minnesota, 1971). Now available as PB 207 131.
- 11 CHRISTOPHER H. LOVELOCK, *Consumer Oriented Approaches to Marketing Urban Transit*, Research Report no. 3, prepared for UMTA (Stanford, Calif.: Stanford University, March 1973). Now available as PB 220 781.
- 12 F. J. STEPHENSON, JR., *Commuter Attitudes and Modal Choice in a Twin Cities Submarket* (Minneapolis, Minn.: University of Minnesota Graduate School of Business Administration, 1973).
- 13 GORDON J. FIELDING, DOUGLAS P. BLANKENSHIP, AND TIMOTHY TARDIFF, "Consumer Attitudes Toward Public Transit," in *Public Transportation Planning*, Transportation Research Record 563 (Washington, D.C.: Transportation Research Board, 1976), pp. 22-28.
- 14 MARTIN WACHS, "Consumer Attitudes Toward Transit Service: An Interpretive Review," *Journal of the American Institute of Planners*, 42, no. 1 (January 1976), 96-104.
- 15 WILLIAM F. HOEY AND HERBERT S. LEVINSON, "Attitude Surveys, Transit Planning, and Auto-Use Constraints" (unpublished paper presented at the 56th Annual Meeting, Transportation Research Board, January 1977).

- 16 Ibid., p. 14.
- 17 CENTER FOR URBAN TRANSPORTATION RESEARCH, *Factors Related to Transit Use*, prepared for UMTA. (Tampa, Fla.: University of South Florida, October 1989).
- 18 KRZYCZKOWSKI, *Integration of Transit Systems*.
- 19 GEORGE M. SMERK, "Mass Transit Management," *Business Horizons*, 14, no. 6 (December 1971), 5.
- 20 LEWIS M. SCHNEIDER, "Marketing Urban Transit," in *Mass Transportation*, Highway Research Record 318 (Washington, D.C.: Highway Research Board, 1970), p. 19.
- 21 SMERK, "Mass Transit Management."
- 22 LOVELOCK, *Consumer Oriented Approaches*.
- 23 REED, *Market Segmentation Development*.
- 24 LOVELOCK, *Consumer Oriented Approaches*.
- 25 REED, *Market Segmentation Development*.

FURTHER READING

- BURKHARDT, JON E., AND MARGARET T. SHAFFER, "Social and Psychological Impacts of Transportation Improvements," *Transportation*, 1, no. 2 (August 1972), 207-26.
- BYRD, JOSEPH P., "Characteristics, Attitudes, and Perceptions of Transit Nonusers in the Atlanta Region," in *Public Transportation Planning*, Transportation Research Record 563, pp. 29-37. Washington, D.C.: Transportation Research Board, 1976.
- CRAIN, JOHN L., "Notes on Factors Affecting Acceptance of Travel Modes" (unpublished paper presented at the 26th Annual California Transportation and Public Works Conference, March 27-29, 1974).
- GOLOB, THOMAS F., "The Survey of User Choice of Alternate Transportation Modes," in *Urban and Regional Ground Transportation: Surveys and Readings*, ed. James J. Murray, pp. 175-85. Durham, N.C.: Planning-Transport Associates, Inc., 1973.
- , RICARDO DOBSON, AND JAGDISH N. SHETH, "Perceived Attribute Importance in Public and Private Transportation" (unpublished paper presented at the National American Institute for Decision Sciences Meeting, Boston, Mass., November 14-16, 1973).
- , AND OTHERS, "An Analysis of Consumer Preferences for a Public Transportation System," *Transportation Research*, 6, no. 1 (March 1972), 81-102.
- HARTGEN, DAVID T., *Variations in Reference Scale and Perception of Modal Attributes for Different Traveler Groups*, Report no. PRR 55. Albany, N.Y.: New York State Department of Transportation, Planning Division, Planning and Research Bureau, December 1973.
- NOTESS, CHARLES, "Life-Style Factors Behind Modal Choice," *Transportation Engineering Journal of ASCE*, 99, no. TE3 (August 1973), 513-20.
- PAINE, FRANK T., AND OTHERS, "Consumer Attitudes Toward Auto Versus Public Transport Alternatives," *Journal of Applied Psychology*, 53, no. 6 (1969), 474-80.
- TARDIFF, TIMOTHY J., "Comparison of Effectiveness of Various Measures of Socioeconomic Status in Models of Transportation Behavior," in *Travel Behavior and Values*, Transportation Research Record 534, pp. 1-9. Washington, D.C.: Transportation Research Board, 1975.

632 Policy Considerations

TRANSPORTATION RESEARCH BOARD, *Behavioral Demand Modeling and Valuation of Travel Time*, Special Report 149. Washington, D.C.: Transportation Research Board, 1974.

WICKSTROM, GEORGE V., "Transportation System Performance Measurement and Application," *Institute of Traffic Engineers: Compendium of Technical Papers, 43rd Annual Meeting*, ed. Walter P. Youngblood, Minneapolis, Minn. (1973), pp. 159-63.

EXERCISES

- 22-1 List the transportation choices available for your most common trip (for example, to and from work or school).
- 22-2 Estimate the out-of-pocket cost for each of the alternatives in Exercise 22-1.
- 22-3 Estimate the total cost per mode for the alternatives in Exercise 22-1 (that is, out-of-pocket cost plus prorated sunk costs such as insurance, capital cost, and subsidy).
- 22-4 The cost per mile for my automobile use in 1989 was approximately 45 cents, broken down as follows:

Miles	17,136
Lease and insurance	\$5469.00 (including depreciation)
Gasoline	\$859.45
Maintenance and repairs	\$1030.42
Parking/tolls	\$ 45.05
Registration	\$ 390.00

- (a) Calculate the cost per mile for your or a friend's automobile travel. (b) What is the cost per gallon of fuel used in part (a)? (c) Compare part (a) with the cost of public transit in your area.
- 22-5 Rank the SCARCE factors in priority order for both a necessary trip (work, school, doctor) and a discretionary trip (recreation, visiting) and explain your reasons for your priority determination.
- 22-6 What improvements in the SCARCE factors would you suggest for the major public transit system in your area?
- 22-7 What are your perceptions (using the SCARCE factors) of public transit service in your area?
- 22-8 Conduct a survey of a minimum of 10 people to determine their priority ranking of the SCARCE factors. What group does your sample most represent?
- 22-9 Rank the importance of the SCARCE factors for the following trips you might take and explain your major differences in factor rankings:
 - (a) A foreign air flight.

- (b) A domestic air flight of over 500 miles.
- (c) A short domestic flight for business.
- (d) A short domestic flight for pleasure.
- (e) An auto trip of 500 miles for business (time critical).
- (f) An auto trip of 500 miles for pleasure (time not critical).
- (g) A train trip of 500 miles for business.
- (h) A train trip of 500 miles for pleasure.
- (i) A bus trip of 500 miles for pleasure.

22-10 You decide to establish a for-hire chauffeured auto service in your community. (a) What would you do to attract first time and continued use? (b) What factors would enter into your fee structure?

22-11 Assume your fleet in Exercise 22-10 is composed equally of limousines, maxi-vans, mini-vans, school buses, and intercity buses. List the potential markets for each type of vehicle and how you would address acceptance of your services based on the general public's perceptions.

